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Foreign Direct Investment Models, Based on Country Risk for Some Post-Socialist Central and Eastern European Economies

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Abstract

This paper identifies several econometric models of Foreign Direct Investment (FDI) focused on the country risk, which can also signal other macroeconomic indicators in Czech Republic, Hungary, Poland, Romania, Russia and Slovak Republic, using data from World Bank and major rating agencies after 1996. The first section presents a brief literature review of FDI's theories and conceptualization. Some methodological aspects and database section provides the statistical and econometrical support of this article and the results consist in several econometric models, parameterized in the Eviews and discussions. The modelling focused on major rating agencies (*Euromoney* and its Country Risk - ECR, the best known European agency, using an average value of Moody's, Fitch, Standard & Poor's country risk) has proved to be competitive not only for Romania, but also for the other post-socialist Central and Eastern European countries. In order to analyze the background of the econometric modelling of FDI, during a long period of transition, two different trends can be identified: the first emphasizing the importance of R squared in the selecting factor's process for the econometric model and the second stressing the primacy of factors' diversity or the factorial eclecticism. The findings justify the importance of FDI models, as a development factor even in times of recession, highlighting the increasing importance of the country risk signal in different countries, not only of the European Union, but even of global economy. Some final remarks of similitude and alternative constructions close this step by step thought about econometric models of FDI, for the benefit of the future econometric models and new original researches of the authors.

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Keywords: country risk; rating agency; foreign direct investment (FDI); econometric model; R squared factor; correlation ratio.

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1. Introduction

The central theme of this paper is, as the title itself shows, the Foreign Direct Investment (FDI) models based on *Euromoney* Country Risk (ECR), applied on Czech Republic, Hungary, Poland, Romania, Russia and Slovak Republic economies, between 1993 and 2012. The specificity of this paper approach to such an important subject as investment in general, and FDI, in particular, lies on the complexity of the new European economic reality, and on the necessity of original research carried out through a careful, systemic, inter-, and trans-disciplinary analysis, and also by means of some new econometric modelling of a phenomenon of exceptional scale, predicted at the beginning as possible in a double time universe As a real example, the increase in FDI of Romanian economy to such a level as that achieved over the last two decades, was considered possible in at least four decades by world economy specialists, immediately after 1996 (Săvoiu and Popa, 2012a).

There are three variants of transnational capitalism emerging in Central and Eastern Europe: *a neoliberal type in the Baltic States, an embedded neoliberal type in the Visegrád states, and a neo-corporatist type in Slovenia, characterized by their institutions and performances* (Benacek, et al. 2000). Foreign direct investments have became an increasingly important element in global economic development and integration processes (Bevan and Estrin, 2004), during the 1990s for a lot of Post-Socialist Central and Eastern European countries (P-SCEEC), simultaneously with a major impact of transition from socialism to capitalism and the integration into the world economy through trade and capital flows (Di Mauro, 1999; Buch, et al. 2003). FDI are seen as an important factor for modelling and understanding GDP evolution and economic growth, and other macroeconomic aggregates and characteristics of all economies (Jaško, *et al*. 2010), including Post-Socialist Central and Eastern European economies. While FDI has some expected important and favourable effect on growth, the volatility of FDI flows has always a negative effect for sustainable development. While some of the Central European countries like Czech Republic, Hungary, Poland, and Slovak Republic, have attracted substantial foreign capital, some of the South Eastern European countries, (i.e. Romania), lag far behind, during the beginning of their transition process (Carstensen and Toubal, 2004). The explanations for regime diversity (Bohle and Greskovits, 2007) and the specific economic potential are the major causes of the differences between the econometric models proposed by this paper. The initial economic choices and risk rating signals were no less crucial for the degree of European Union inclusion, and for the different patterns of convergence on the paths towards the new market economy.

Modelling the FDI's phenomenon is not possible, or cannot be validated as having any utility in statistical predictions or economic simulations, without a theoretical basis, that means a deep knowledge of the specific concepts, theories, methods and models, a cursory review of the last together with the established historical and the recent patterns, are the necessary steps to an obvious character of originality for this kind of article. This manner of working allow a sequential development of econometric models of FDI based on *Euromoney* Country Risk (ECR): a) grounded on statistical indicators of value; b) centred on relative indicators such as statistical indexes; c) focusing on relative indicators such as statistical rates and rhythms; d) derived from structural indicators and GDP shares; e) fully original models of FDI, in relation to country risk rating. This article presents directly the final stage or step.

The reminder of this paper is organized as follows. After a brief introduction, prior to a modelling approach, the need was felt for a theoretical retrospective specially focusing on the concept of foreign direct investment, and its implications at the national and global level, and also the main theories on FDI and on the main categories of models supported by the most important theories of FDI and introduces a new element in modelling investment, namely country risk rating. The third section is a succinct stage-ordered and methodological description of econometric modelling for the FDI, followed by the presentation of the both quantitative and qualitative terms, of the databases, selecting the World Bank databases satisfying the requirement to the greatest extent, ensuring comparability of monetary option for U.S. dollar, and the careful construction of the additional databases, in particular for the exogenous variable of country risk rating and of the indicators derived from these specific scores, represent elements of both scientific rigor, and originality. The last section is devoted to the econometric modelling of FDI based on *Euromoney* Country Risk (ECR), applied on Czech Republic, Hungary, Poland, Romania, Russia and Slovak Republic economies, between 1993 and 2012, a number of models, both single- and multi-factor, observing the principle of equivalence of information inputs and outputs, were selected from the investigation of the domestic and international econometric literature, adequate to this subject.

2. A brief literature review of FDI's conceptualization and theories

In the real economy, the investment process has both endogenous and exogenous determinations: the investment realized by a firm or corporation may be made in their own residential or other non-residential economies and investments in a country can have domestic or attracted sources. This aspect has major implications in specifying the econometric models of investment, in general. The analysis of the impact of FDI on some of the P-SCEEC economies, in a difficult period of deep restructuring and integration in UE emphasise the importance of the major theoretical concepts and theories in deeply understanding the specific character of international investment processes.

The micro-economic definitions emphasizes that *FDI occurs when an individual or firm acquires controlling interest in productive assets of another country* (http://www.dictionaryofeconomics.com/) and the macro-economic conceptualization underlines the FDI as a component of country's national financial accounts, being an investment of foreign assets into domestic structures, equipment, and organizations (On–line dictionary *Economics About*, http://economics.about.com/). The last FDI 2013 survey have used a simple and modern methodological definition, that stipulates that *FDI are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor, as the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital* as shown in IMF Balance of Payments Manual, 5th edition (BPM6).

A major group of classical FDI theories are based on the last century's *trade theories*, from the absolute or relative comparative advantage theories in simple or generalized scheme, to the theoretical model of commercial gravitation, from the Heckscher-Ohlin theoretical model (Heckscher, 1919; Ohlin, 1933), to Leontief's paradox (Leontief, 1953), from the theory based on the Linder assumption (Linder, 1961), the location theory, the theory of market imperfections (Hymer, 1976; Kindleberger, 1969; Caves, 1971), etc. Another class of theory have focused on *traditional approaches*, from the theory of FDI, based on monopolistic advantage (Hymer, 1976), or non-availability (Kravis, 1956), or technological gap (Posner, 1961), to the Uppsala theoretical model, or from the theory of information dissemination (Rogers, 1962), to the well known *eclectic theory or paradigm* (Dunning, 1993), etc.; The last of the classical group are constructed on the *exogenous factorial diversity*, from the behavioural theory of the firm (Cyert and March, 1963; Aharoni, 1966), to the contingency theory, from the contract theory, to the theory of scale economy, from the internalization theory (Buckley and Casson, 1976; Rugman, 2009), to the product life-cycle theory (Vernon, 1966), and from the theory of firm growth (Penrose, 1959), to the transaction cost theory, etc.

It can be also conclusively noted that no investment theory is explanatorily single-factor and distinctively delimited from all the older or more recent economic theories of foreign direct investment, as they are all, to a smaller or larger extent, unexpected theoretical mixtures or original syntheses with multi-impact assessment. The most complex example is the eclectic theory, or John Dunning's OLI model that focuses on the paradigm of eclecticity, i.e. an apparently new concept, which is in fact a mixture of previous concepts, a non-homogeneous system of thought, with no original ideas, still taking over the significant ideas in various theories or approaches, also synthesizing the microeconomic and the macroeconomic segments of the FDI theory, bringing together the international trade theory and the theory of investment localization, and combining factors and arguments from the theory of monopolistic advantage and internalisation theories.

The models of FDI phenomenon could be classified in five specific classes of econometric models: a) based on the correlation: economic growth - FDI (Keynes, 1930; Clarke, 1995; Harrod-Domar, 1939,1946; Solow, 1956 etc.); b) defined by the FDI economic conceptualization (Kindleberger, 1969; Calvet, 1981; Kojima, 1973; Aliber, 1970); c) underlining the structure as major classical aspects (Leontief, 1953 etc.); d) emphasizing the eclectic, trans-, and interdisciplinary FDI approach (eclectic models restructured continuously after R squared and major statistical tests of the model validation, diversified by Stopford and Strange, 1991; Porter, 1992; Dunning, 1993); e) identifying signal variables as endogenous factors like crises / recession signals or the country risk rating signal (Săvoiu, *et al*., 2013).

From the crises / recession signals' models the most important are based on signals offered by GDP, or growth rates of GDP, or GDP / capita as an indicator of overall productivity in an economy (Kobrin, 1976; Nigh, 1986; Grosse and Trevino, 1996; Wells and Wint, 2000) models based on correlation between business cycle, productivity and FDI (Larudee and Koechlin, 1999; Wang and Wong, 2007), and the models able to measure the FDI correlated with indicators of external trade, based on the export orientation of the host country or based on correlation of the

exports with the growing demand (Jun and Singh, 1996; Rob and Vettas, 2003), etc.

The last but not the least category of models that includes also this paper's models reunites with the models that correlate different risks of instability and FDI like macroeconomic risk (Jinjarak, 2007), or with general political risk's models (Kobrin, 1976; Kim, 2010), or with the models restricted to the risk of ensuring fundamental political human rights (Fallon, Cook and Billimoria, 2001), and finally with the models linking FDI with country risk based on the specialized agencies' rating as *Euromoney* and its Country Risk - ECR, the best known European agency, Moody's and its Country Risk -MCR, Fitch and its Country Risk - FCR, Standard & Poor's and its Country Risk –S & PCR, etc.(Săvoiu and Popa 2012a; Săvoiu and Popa, 2012b; Săvoiu, *et al*. 2013).

An important consequence of the evolution of FDI theories, focusing on specific dynamics of P-SCEEC's economies, can be derived from the theory of FDI of Czech economists Josef Brada and Vladimir Tomsik, with respect to their model of FDI financial life cycle (Brada and Tomšík, 2009), and it could be able to offer a new solution to their needs for econometric modelling, based on correlations between profits, dividends and reinvested earnings from FDI evolutions. In a statistical multi-causal manner, these original models seems to be for the next future the characteristic cases of P-SCEEC's economies, still in a convergence period to average level of European Union and considering their integration into the same European Union or their investment - based relations to UE, for Russian economy.

3. A succinct methodological approach to the FDI econometric modelling

A succinct methodological description opens the econometric modelling for the foreign direct investment in some P-SCEEC's economies, after the year 1993, followed by the presentation of the general data bases, and the major source that are capitalized in the econometric modelling approach to FDI.

Based on a careful presentation and data analysis, in both quantitative and qualitative terms, of the databases, the authors have selected the World Bank databases, that meet the highest coverage of unified methodological from a statistical standpoint (temporally, spatially and structurally), satisfying the requirement to the greatest extent, ensuring comparability of monetary option for U.S. dollar, and the careful construction of the relative values from the absolute ones, in particular for the exogenous variable of country risk rating and of the indexes derived from these specific scores, represent elements of both scientific rigor, and originality, evident through the optimal solutions adopted. The second important objective of this methodology was to find the most adequate rating or grading system of country risk, made by a specialized Agency, that meet the highest suitability and distinguish the low-risk and the high-risk countries, and to rank the economies delimiting those of unacceptable risk. The rating / grading scale of *Euromoney* Agency summarizes in its evaluation not only European thought (European investors are dominant in FDI entered in some P-SCEEC's economies), but also for its average value between the three major credit U.S. rating agencies, viz. Moody's, Standard & Poor's and Fitch.

The ECR rating was processed and brought, in annual terms, to only two variants (ECR var1 = beginning of the year rating, usually published in March; ECRvar2 = end of year rating, usually published in September), and subsequently expressed per country as percentage values similar to the rest of the econometric model's factors.

Before applying the modelling technique, the methodological analysis of the data has been used as necessary and significant solution for the exogenous factors, abbreviated as ECR var1 or ECR var2, defining the *Euromoney* country risk variables (where the descriptive statistics show in table 1 high homogeneity, identify a moderate negative asymmetry and normal distribution using for the last quality the Jarque-Bera test, that certifies the null hypothesis of the normal distributed variables integrated as major factors into the econometric models of the evolution and magnitude of FDI values in some P-SCEEC's economies).

Table 1. The descriptive statistics of the *Euromoney* data base for the external signal of the country risk rating

Sample: 1993 2012	*Euromoney* Country Risk (ECR) -Annual Ratings of March						*Euromoney* Country Risk (ECR)-Annual Ratings of September					
	ECRCZE var1	ECRHUN var1	ECRPOL var1	ECRROM var1	ECRSVK var1	ECRRUS var1	ECRCZE var2	ECRHUN var2	ECRPOL var2	ECRROM var2	ECRSVK var2	ECRRUS var2
Mean	69.575	64.883	61.355	47.550	61.361	43.012	69.280	64.982	63.022	48.955	61.835	45.521
Median	70.455	67.695	64.700	48.890	63.000	44.975	69.540	66.805	65.290	50.510	61.930	49.870
Maximum	76.600	72.070	71.110	57.390	74.320	60.050	77.910	71.060	71.440	58.330	76.270	63.060
Minimum	54.890	49.650	35.780	33.800	45.320	18.130	60.850	49.650	44.590	36.620	47.220	23.020
Std. Dev.	5.2270	6.2048	9.4342	6.7427	8.8860	13.379	4.4322	5.8040	8.2069	6.2829	8.8351	13.180

Skewness	-1.0708	-0.8811	-1.5274	-0.5147	-0.4212	-0.4137	-0.1201	-1.0944	-1.2636	-0.5696	-0.0617	-0.4742
Kurtosis	4.2184	2.8672	4.4276	2.4093	2.2310	1.8567	2.3535	3.5452	3.4446	2.4009	2.0470	1.8938
Jarque-Bera	5.0596	2.6025	9.4755	1.1740	1.0842	1.6597	0.3963	4.2405	5.4871	1.3805	0.7693	1.7694
Probability	0.0796	0.2721	0.0087	0.5560	0.5815	0.4360	0.8202	0.1200	0.0643	0.5014	0.6806	0.4128
Sum	1391.5	1297.6	1227.1	951.00	1227.2	860.25	1385.6	1299.6	1260.4	979.709	1236.7	910.43
SumSq.Dev.	519.12	731.51	1691.11	863.82	1500.27	3401.03	373.24	640.05	1279.7	750.033	1483.1	3300.8

Source: The software used by the authors to obtain the descriptive statistics is Eviews and ECR data have been divided in two variants the *Euromoney* Agency's ratings available on *http://www.euromoneycountryrisk.com/*

Analyzed in parallel with EU evolution, the graphical level of the FDI as % of GDP for some P-SCEEC's economies is relative similar and also less volatile, revealing a consistent or homogeneous dynamics, located, as any other average value within a restricted internal area of extreme particular (maximum and minimum) values, but within a much narrower variation interval (with only one exception, the value of FDI in Hungary or FDIHUN, presented in green coloured bars in the fig. 1)

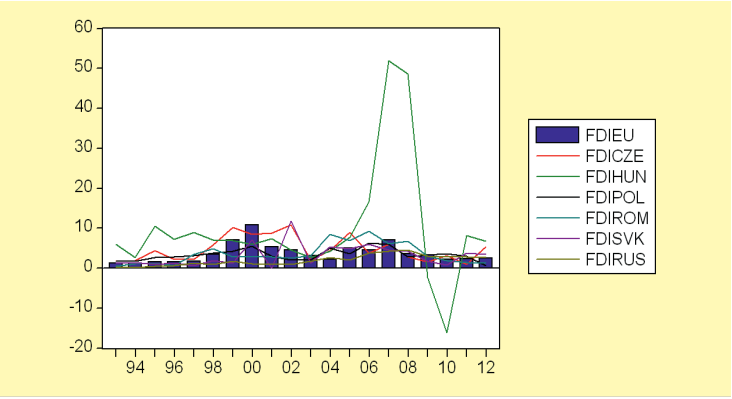

Fig. 1. The level of Foreign Direct Investment, net inflows (FDI as % of GDP) in some P-SCEEC's economies, during the period 1913- 2012

During the period 1993-2012, the analysed P-SCEEC's economies have evolved towards an investment - based economy, alternating inherent ascending oscillations specific to economic boom with descending, characteristic to crisis or recession, analyzing in parallel economic real growth and the shares of GDP represented by Gross Fixed Capital Formation and Gross Savings (see table 2).

Table 2. Annual evolution of Growth and Gross Fixed Capital Formation & Gross Savings (% of GDP), in the EU and worldwide (W)

Sample: 1993 2012	EU GDP Growth (annual %)	W GDP Growth (annual %)	EU Gross Fixed Capital Formation (% of GDP)	W Gross Fixed Capital Formation (% of GDP)	EU Gross savings (% of GDP)	W Gross savings (% of GDP)
1993	-0.2	1.8	19.3	21.3	18.6	20.7
1994	2.9	3.3	19.3	21.4	19.2	21.4
1995	2.7	2.9	19.4	21.4	20.1	21.7
1996	1.9	3.4	19.4	21.5	20.0	21.9
1997	2.8	3.7	19.4	21.6	20.6	22.6
1998	3.0	2.4	20.0	21.6	20.9	22.3
1999	3.0	3.3	20.3	21.5	20.5	21.8
2000	3.8	4.3	20.6	21.6	20.3	22.1
2001	2.0	1.6	20.1	21.1	20.2	21.1
2002	1.2	2.0	19.5	20.4	20.1	20.4
2003	1.3	2.7	19.2	20.3	19.8	20.5
2004	2.5	4.1	19.3	20.8	20.6	21.5
2005	1.9	3.6	19.6	21.3	20.3	21.9
2006	3.3	4.1	20.2	21.7	21.2	22.9
2007	3.0	4.0	20.7	21.7	22.0	22.6
2008	0.4	1.5	20.5	21.4	20.8	21.4
2009	-4.4	-2.3	18.5	19.6	18.0	18.5
2010	2.0	4.2	18.2	19.3	18.5	19.3
2011	1.7	3.8	18.3	19.4	19.0	20.6
2012	-0.4	3.0	17.7	19.1	18.7	20.5

Source: http://data.worldbank.org/indicator.

Macroeconomic growth to the both level (EU and worldwide) consists of a more heterogeneous evolution caused by the economic polarization, the impact of downward of saving level and investing specific to the first decade of a new millennium and to the last recession, and also in spite of the convergence and cohesion trends in to a global market economy (the extended global impact of Chinese economy and its investments constitute a major cause that explain the gap between UE and worldwide tendencies). If all these correlated values for growth and investment indicators are compared, it can be found that in terms of statistical confrontation, the differences between the world dynamics and EU, are significant, the EU's macroeconomic indicators being more heterogeneous and placed beneath the level of the global evolution and the real economic growth is the only series of data that revealed abnormal distribution, based on the values of Jarque – Bera test (see table 3).

Table 3. Descriptive statistics of Growth and Gross Fixed Capital Formation and Gross Savings (% of GDP), in the EU and worldwide (W)

Sample: 1993 2012	World			European Union		
	GDP Growth (annual %)	Gross Fixed Capital Formation (% of GDP)	Gross Savings (% of GDP)	GDP Growth (annual %)	Gross Fixed Capital Formation (% of GDP)	Gross Savings (% of GDP)
Mean	2.825000	21.02000	21.30500	1.785000	19.62000	19.98500
Median	3.300000	21.40000	21.45000	2.000000	19.45000	20.15000
Maximum	4.300000	21.70000	22.90000	3.800000	20.70000	22.00000
Minimum	-2.300000	19.30000	18.50000	-4.400000	18.20000	18.00000
Std. Dev.	1.517919	0.787133	1.102855	1.777128	0.750158	0.999618
Skewness	-1.958225	-1.225762	-0.867017	-2.188460	-0.291097	-0.226762
Kurtosis	7.458030	3.048865	3.497057	8.416467	2.265766	2.581057
Jarque-Bera	**29.34385**	5.010296	2.711614	**40.41295**	0.731708	0.317665
Probability	0.000000	0.081664	0.257739	0.000000	0.693604	0.853139
Sum	56.50000	420.4000	426.1000	35.70000	392.4000	399.7000
Sum Sq. Dev.	43.77750	11.77200	23.10950	60.00550	10.69200	18.98550
Observations	20	20	20	20	20	20

Source: The software used by the authors to obtain the descriptive statistics is Eviews and the values of the specific macroeconomic rates are selected from the World Bank database, available on http://data.worldbank.org/indicator.

The *Euromoney* Country Risk ratings affect in varying degrees the investment decision (from one economy to another), and correlates with the expected profits significantly, and capture the impact of relevant macroeconomic variables, generating the specific European distribution of FDI, congruous with the recognized competitiveness of European economies (i.e. the analysed P-SCEEC's economies).

Finally, from all the analysed indicators, based not only their own experience (Săvoiu, Crăciuneanu, 2010;

Săvoiu, Crăciuneanu, Ţaicu, 2010; Jaško, Cudanov, Popovic and Săvoiu, 2010; Săvoiu, 2011, Săvoiu 2012a, Săvoiu and Popa, 2012b; Săvoiu and Popa, 2012c; Săvoiu and Popa, 2012d; Săvoiu, *et al*., 2013; Săvoiu and Săvoiu, 2013), but also on the R^2 or R squared values, the authors have selected a data base containing seven variables for a general econometric model: a) two *Euromoney* Country Risk variables (ECR var1 and ECR var2); b) one macro-variable of profitability and recognized competitiveness (GDP growth as annual %); c) one variable for investment-based economies (Gross Fixed Capital Formation as % of GDP); d) one variable of vital importance for the economic survival (Gross Savings as % of GDP); e) two variables defining the level of Foreign Direct Investment (FDI), net inflows as % of GDP (one as endogenous variable of the final econometric model specific for each of the selected P-SCEEC's economies, and one as exogenous variable representing the FDI in EU as% of GDP in EU).

4. Some FDI econometric models, applied on Czech Republic, Hungary, Poland, Romania, Russia and Slovak Republic, based on Euromoney Country Risk (ECR)

The econometric models based on the country risk as the major exogenous variable of the level of Foreign Direct Investment (FDI) are however rare in the statistic and mathematic literature. The beginnings of this specific econometric modelling are built on empirical evidence and uses regression analysis, defining a strong correlation between FDI and aggregate country risk in the East Asian Economies and Industries (Ramcharrana, 1999), followed by different models of FDI in Romanian economy based on the signal of country risk ratings and other more than 70 variables described in a lot of multi-factorial regressions (Săvoiu and Popa, 2012a; 2012b; 2012c). Another modelling tendency selects political risk as a determinant factor of investment stability (Thomas, 2006). Some more recent econometric models select U.S. economy after studying over 100 national economies, because of its high intensity of the correlation between FDI and country risk assessment (Vijayakumar, Rasheed, and Tondkar, 2009) and are concerned with regional issues of modelling (Lee and Rajan, 2011) or, finally, are dedicated to Western countries, mainly in the European Union (Bevan and Estrin, 2004) and to Romanian economy, during two decades, or more precisely in the period 1990 - 2010 (Săvoiu, *et al*, 2013).

Parallel trends underline the need to improve the accuracy of country risk modelling by means of original techniques and statistical methods (Săvoiu and Popa, 2012d), based on hybrid neural networks, logit models, or discriminating cluster analyses (Yim and Mitchell, 2005), and seek to increase the role of the variable country risk in anticipating crises (Roa, García and Bonilla, 2009) etc.

In this paper, econometric modelling of FDI, in accordance with country risk rating has been considered the first and original hypothesis, which is to be totally / partially or even not at all validated (Slovak Republic), by the selected P-SCEEC's economies. In the table 4, the matrix of correlation characterizes the intensities of correlations with net FDI for the ECR var1 or ECR var2 in all the six countries from the investigated economic area.

Table 4. Matrix of correlation between FDI (net inflows as % of GDP) and ECRvar1 and ECR var2 in selected P-SCEEC's economies

Sample: 1993 2012	ECRCZE var1	ECRHUN var1	ECRPOL var1	ECRROM var1	ECRSVK var1	ECRRUS var1
FDI (% of GDP)	-0.154212	**0.280367**	**0.346777**	**0.455877**	0.120020	**0.828717**
Sample: 1993 2012	ECRCZE var2	ECRHUNvar2	ECRPOL var2	ECRROM var2	ECRSVK var2	ECRRUS var2
FDI (% of GDP)	**-0.639850**	**0.263965**	**0.376281**	**0.414697**	0.097771	**0.828805**

Source: The software used by the authors to obtain the matrix of correlation values is Eviews and ECR data have been divided in two variants from *Euromoney* Agency's ratings available on *http://www.euromoneycountryrisk.com/*

The second hypothesis of this paper is that of greater intensities in the correlation with FDI in EU as % of GDP of EU, which becomes the second exogenous variable for the final models, in the context of high values obtained from a matrix of correlation (see table 5), with one exception: Russian economy.

Table 5. Matrix of correlation between FDI in selected P-SCEEC's economies (net inflows as % of GDP) and FDI in EU as% of GDP of EU

Sample: 1993 2012	FDI (% of GDP) CZE	FDI (% of GDP) HUN	FDI (% of GDP) POL	FDI (% of GDP) ROM	FDI (% of GDP) SVK	FDI (% of GDP) RUS
FDI in EU as % of EU GDP	**0.695255**	**0.266907**	**0.602407**	**0.277857**	**0.431523**	0.182192

Source: The software used by the authors to obtain the matrix of correlation values is Eviews and the values of the specific FDI in EU as % of GDP of EU from the World Bank database, available on http://data.worldbank.org/indicator.

The third hypothesis is related to a higher value of R squared or R^2 (underling a higher correlation) between FDI of the selected P-SCEEC's economies (net inflows as % of GDP) with Gross Savings (% of GDP) or Gross Fixed Capital Formation (% of GDP) of indicators from European Union and compared with the similar worldwide values (see table 6).

Table 6. Matrix of correlation between FDI (net inflows as % of GDP) and Gross Savings (% of GDP) in EU and worldwide or Gross Fixed Capital Formation (% of GDP) in EU and worldwide for selected P-SCEEC's economies

Sample: 1993 2012	FDI (% of GDP) CZE	FDI (% of GDP) HUN	FDI (% of GDP) POL	FDI (% of GDP) ROM	FDI (% of GDP) SVK	FDI (% of GDP) RUS
EU Gross Savings (% of EUGDP)	**0.399937**	**0.661003**	**0.626265**	**0.660424**	**0.289359**	**0.228448**
W Gross Savings (% of WGDP)	0.237704	0.495977	0.489092	0.439185	0.108929	-0.052407
EU Gross Fixed Capital Formation (% of EUGDP)	**0.446451**	**0.601156**	**0.592033**	**0.474474**	**0.214121**	0.043744
W Gross Fixed Capital Formation (% of WGDP)	0.228153	0.455639	0.427773	0.334754	-0.009670	**-0.240510**

Source: The software used by the authors to obtain the matrix of correlation values is Eviews and the values of the specific macroeconomic rates are selected from the World Bank database, available on http://data.worldbank.org/indicator.

The last hypothesis considered the real economic growth in EU to be totally / partially with FDI as % of GDP for the selected P-SCEEC's economies, but more intensive than with the worldwide economic growth (see table 7).

Table 7. Matrix of correlation between FDI (net inflows as % of GDP) and Economic Growth (% of GDP) in national economy, EU and worldwide for selected P-SCEEC's economies

Sample: 1993 2012	FDI (% of GDP) CZE	FDI (% of GDP) HUN	FDI (% of GDP) POL	FDI (% of GDP) ROM	FDI (% of GDP) SVK	FDI (% of GDP) RUS
National economic growth (% of GDP)	*0.236672*	-0.042705	*0.417367*	**0.352868**	**0.214079**	**0.519268**
EU economic growth (% of EU GDP)	**0.320775**	0.133330	**0.456409**	*0.219350*	0.096287	-0.001674
W economic growth (% of W GDP)	0.135465	0.054079	*0.355420*	0.170204	0.151221	-0.194491

Source: The software used by the authors to obtain the matrix of correlation values is Eviews and the values of the specific macroeconomic rates are selected from the World Bank database, available on http://data.worldbank.org/indicator.

In general, the absence of a real correlation and the negative value that are validated for the contemporary economy of Hungary, but in the very next future for many other EU members, and maybe for all Central and Eastern European countries, evaluated as being in the end of the second phase of FDI financial life cycle (Brada and Tomsik, 2009), the impact of FDI is negative because of many causes, including the profit repatriation.

Finally, using the findings of these series of interrelated matrices and of correlated data for the seven standard selected variables (multiplied for six countries or economies), numerous potential single- and multi-factorial econometric models were identified, focusing on relative indicators (derived from National Accounts), for the period 1993 - 2012, with selected data of the P-SCEEC's economies, and also EU and even global economy.

The paper proposes some initial competitive or non-competitive models, which are single- (see table 8) and multi-factorial linear (see table 9), according to the links inspired by matrices of correlations. To avoid the impact of the spurious regression hypothesis or illusory correlation, the information based on the coefficient of determination (R-squared) has been integrated or combined with Durbin-Watson and F test, analyzing and thus all this tests together have validate (e.g. Czech Republic and Russia for single factorial models) or invalidate (i.e. Poland and Romania single - factorial models) the final econometric constructions.

Table 8. Some competitive single-factorial and linear models of correlation between FDI (net inflows as % of GDP) and ECRvar1 and ECR var2 in selected P-SCEEC's economies

Sample: 1993 2012 Country	Dependent Variable: FDI Method: Least Squares Specified models for the 20 – term series	R-squared	Durbin-Watson statistic	F-statistic	Observations (validated model= VM)
Czech Republic	**$FDI_i = 36.09666 + (-0.452175) \times ECR\ var2_i + \varepsilon_i$**	0.409408	1.747998	12.47788	VM*
Hungary	*There is no single – factorial model based on ECR*	**0.078606**	-	-	-
Poland	*$FDI_i = -0.915794 + (0.067687) \times ECR\ var2_i + \varepsilon_i$*	*0.141587*	*1.183653*	**2.968938**	*Invalidated model*
Romania	*$FDI_i = -4.937484 + (0.178496) \times ECR\ var1_i + \varepsilon_i$*	*0.207824*	***0.731535***	*4.722220*	*Invalidated model*
Russia	**$FDI_i = -1.552820 + (0.081321) \times ECR\ var1_i + \varepsilon_i$**	0.686771	1.450700	39.46602	VM**
Slovakia	*There is no single – factorial model based on ECR*	**0.014405**	-	-	-

Source: Research results. *Abbreviation note:* Foreign Direct Investment = FDI_i; *Euromoney* Country Risk exogenous variables, published in March and September = ECR $var1_i$ and ECR $var2_i$. *Note**: The model has a value d = 1.747998 ($d_2 < d < 4 - d_2 \Rightarrow$ errors are independent, i.e. 1.14675< 1.747998 < 2.73926 for the values $d_1 = 0.95243$ and d_2=1.14675, taken from http://www.stanford.edu/~clint/bench/dw01a.htm)
*Note***: The model has a value d = 1.4507 ($d_2 < d < 4 - d_2 \Rightarrow$ errors are independent as in the other validated model). *Software used*: *Eviews*.

For the selected P-SCEEC's economies, which are members of UE, the contagious effects of UE indicators and trends had and still have an important impact on econometric modelling of FDI evolution as major exogenous factors. Some of the next multi-factorial and linear models of correlation for FDI (net inflows as % of GDP) in selected P-SCEEC's economies have detailed a small number of exogenous factors, and the most of them can be defined as validated models and thus these have proved the ability to become a significant solution in estimating FDI's trend based on ECR (successfully passing the Durbin-Watson and Fisher Snedecor tests)

Table 9. Some multi-factorial and linear models of correlation for FDI (net inflows as % of GDP) in selected P-SCEEC's economies

Sample: 1993 - 2012 Country	Dependent Variable: FDI Method: Least Squares Specified models for the 20 – term series	R-squared	Durbin-Watson Statistic (d)	F-statistic	Observations (validated model= VM) $d_2 < d < 4 - d_2 \Rightarrow$ $\Rightarrow$errors are independent
Czech Republic	**$FDI_i = 21.71743 + (-0.279254) \times ECR\ var2_i + (0.644098) \times EU\ FDI_i + \varepsilon_i$**	0.602583	2.3809	12.8881	VM* 1.2705 < 2.3809 < 2.7295
Hungary	**$FDI_i = -231.092 + (-1.6315) \times ECR\ var1_i + (4.177) \times EUGFCF_i + (-8.081) \times WGS_i + (21.9) \times EUGS_i + \varepsilon_i$**	0.625667	1.6230	6.2678	VM* 1.5669 < 1.6230 < 2.4331
Poland	**$FDI_i = -11.64 + (0.031) \times ECR\ var2_i + (0.613) \times EUGS_i + (0.22) \times EUGS_i + (0.644098) \times EUFDI_i + \varepsilon_i$**	0.548335	1.7812	6.4748	VM* 1.5669 < 1.7812< 2.4331
Romania	**$FDI_i = -32.494 + (0.189595) \times ECR\ var2_i + (1.2919) \times EUGS_i + (0.2585) \times EU\ FDI_i + \varepsilon_i$**	0.582429	1.4192	7.4390	VM* 1.4109 < 1.4192< 2.5891
Russia	**$FDI_i = -6.7967 + (0.08) \times ECR\ var1_i + (0.26385) \times EUGS_i + \varepsilon_i$**	0.728532	1.3815	22.8112	VM* 1.2705 < 1.3815 < 2.7295
Slovakia	*$FDI_i = -1.130 + (0.0615) \times ECR\ var1_i + (0.1569) \times G_i + (-0.1125) \times WGS_i + (0.577795) \times EUGS_i + \varepsilon_i$*	*0.265449*	*2.8062*	**1.3552**	*Invalidated model*

Source: Research results. *Abbreviation note:* Foreign Direct Investment = FDI_i; *Euromoney* Country Risk exogenous variables, published in March and September = ECR $var1_i$ and ECR $var2_i$; Foreign Direct Investment in EU = $EUFDI_i$; EU Gross Fixed Capital Formation as % of GDP = $EUGFCF_i$; W Gross Savings as % of GDP = WGS_i; EU Gross Savings as % of GDP = $EUGS_i$ and economic growth = G_i
*Note**: The DW values d_1 and d_2 are taken from http://www.stanford.edu/~clint/ bench/dw01a.htm. *Software used*: *Eviews*.

The two econometric models for Czech Republic and Russia, in their single-factorial variants, based on ECR and described above (table 8), have proved different influences (positive and negative), and intense correlations, and thus being instruments of prognosis or simulation for the future level of the net FDI in these countries, without any supplementary exogenous variables (PHARE investments represent a reality of this kind of modelling and an expression of the communitarian help for Czech Republic). But the real econometric models are multi-factorial and all original models used a necessary extension at the level of the European Union indicators, and prove the dependence of the FDI level in UE or savings' level in UE. The model of FDI for Slovak Republic is difficult to be validated because of its independence of ECR (in both variants: var1 or var2) and also by the lack of statistical FDI level comparability for 2001 (from the World Bank database, available on http://data.worldbank.org/indicator).

5. Conclusions

In the third and fourth sections, devoted to the econometric modelling of FDI in the P-SCEEC's economies after the year 1993, a substantial number of models, both single- and multi-factor, observing the principle of equivalence of information inputs and outputs, were selected from the investigation of the domestic and international econometric literature devoted to the subject in the second section, nothing else but a literature review of the theories and conceptualizations.

The econometric models were constructed from the series of data on FDI, between 1993 and 2012, according to the World Bank and the *Euromoney* Agency. The econometric models of FDI, focused on country risk, being obtained with support on the analyses and methodologies from the Weekly Bulletin on the Euromoney website, that is through access to the historical database allowed by Chilli Wutte (*with due grateful acknowledgements*). The quantitative conclusions of the paper resize the investigative econometric effort, emphasizing the fact that about 40 models have been identified, listed and specified, and then parameterized, resulting from the careful analysis of the seven major variables used (multiplied for 6 countries or economies). Out of the 40 econometric models of FDI in the P-SCEEC's economies originally proposed, only twelve were subsequently selected and entered in a final competition, and as few as six of them have passed the detailed tests, being validated finally (excluding Slovak Republic's model).

The authors of the paper believe that the originality of the paper's econometric approach is lent by three major aspects: a) the genuineness of the statistical methodological approach meant to ensure comparability; b) the original working method, based on the theoretical grounding of FDI economic theories, while taking advantage of statistical and mathematical criteria of the values of the correlation and determination ratio, derived from the classical econometric matrices, while also facing the reality of economic relationship, and thus generating an original method of selection and presentation, like a further step in the econometric modelling of complex phenomena; c) the integration of the country risk rating (score) as ECR exogenous variable into the econometric model of FDI, was done as a pioneering act, in the selected P-SCEEC's economies, which proves an intensive correlations inside the European Union, which is in fact the essence of the originality of the paper compared to many other similar treatments of the FDI phenomenon in the domestic and international literature.

A final remark points out that, in determining FDI, the major theories and models must underline the signal and the localisation importance of the key exogenous variables, regarding the host country, and there still are many factors that can contribute to the UE area (place) of a greater inflow of FDI, which has to quickly find solutions, in spite of a real existence of a "contagious" and positive effect of being member of EU for FDI in the selected P-SCEEC's economies.

References

Aharoni, Y., 1966. The foreign investment decision process. Harvard University Press: Boston, MA.

Aliber, R.Z., 1970. A Theory of Direct Foreign Investment, in, Kindleberger C.P the International Corporation, A Symposium, MIT press.

Benacek, V., Gronicki, M., Holland, D., Sass, M., 2000. The Determinants and Impact of Foreign Direct Investment in Central and Eastern Europe: A comparison of survey and econometric evidence. Transnational Corporations, Journal of United Nations, 9(3), 163-212.

Bevan, A. A., Estrin, S., 2004. The determinants of foreign direct investment into European transition economies. Journal of comparative economics, 32(4), 775-787.

Bohle, D., Greskovits, B., 2007. Neoliberalism, embedded neoliberalism and neocorporatism: Towards transnational capitalism in Central-Eastern Europe. West European Politics, 30(3), 443-466.

Brada, J. C., Tomšík, V., 2009. The Foreign Direct Investment Financial Life Cycle: Evidence of Macroeconomic Effects from Transition Economies. Emerging Markets Finance and Trade, 45(3), 5-20.

Buch, C., Kokta, R., Piazolo, D., 2003. Does the East get what would otherwise flow to the South? FDI diversion in Europe. Journal of Comparative Economics 31, 94–109.

Buckley, P. J., Casson, M. C., 1976. The Future of the Multinational Enterprise, London: Macmillan [25th Anniversary ed. 2001].

Calvet, A.L., 1981. A Synthesis of Foreign Direct Investment Theories and Theories of the Multinational Firm, Journal of International Business Studies (12) 1, 43-59.

Carstensen, K., Toubal, F., 2004. Foreign direct investment in Central and Eastern European countries: a dynamic panel analysis. Journal of comparative economics, 32(1), 3-22.

Caves, R. E., 1971. International corporations: The industrial economics of foreign investment. Economica, 38(149), 1-27.

Clark, DP., 1995. Trade Orientation and Industrial Sector Growth in Developing Countries, Journal of Developing Areas, Vol. 30, 1-10

Cyert, R. M., March, J. G., 1963. A Behavioral Theory of the Firm.Prentice Hall, Englewood Cliffs, NJ.

Di Mauro, F., 1999. The effects of economic integration on FDI flows: an empirical analysis and comparison with trade. Document paper No. 134. Center for European Policy Studies, Brussels.

Domar, E., 1946. Capital Expansion, Rate of Growth, and Employment, Econometrica, Vol. 14, 137-47.
Dunning, J.H., 1993. Multinational enterprises and the global economy, Addison-Wesley, Wokingham.
Fallon, G., Cook, M., Billimoria, A., 2001. What factors attract foreign direct investment? Teaching Business & Economics, vol. 5(3), 3-13.
Grosse, R., Trevino, L.,1996. Foreign Direct Investments in the United States: An Analysis by Country of Origin. Journal of International Business Studies, vol 27(1), 139-155.
Harrod, R.,1939. An Essay in Dynamic Theory. Economic Journal, 49(193), 14-33.
Heckscher, E., 1919. The Effects of Foreign Trade on the Distribution of Income, Ekonomisk Tidskrift, Vol. 21, 497-512
Hymer, S., 1976. International operations of national firms: A study of direct investment, MIT Press, Cambridge, MA.
IMF, Balance of payments (BoP) and international investment position (IIP) manual (BPM6)-Statistics Explained (2013/7/5), http:// epp.eurostat.ec.europa.eu/statistics_explained/index.php/Balance_of_payments_and_international_investment_position_manual_(BPM6)
Jaško, O., Čudanov, M., Popovic, N., Săvoiu, G., 2010. Foreign Direct Investments in South-Eastern Europe Countries Analysis of Influence Factors, Romanian Statistical Review, Romanian Statistical Review, vol. 58(9), 19-32.
Jinjarak,Y., 2007. Foreign direct investment and macroeconomic risk. Journal of Comparative Economics, Vol. 35, Issue 3, 509-519.
Jun, K.W., Singh, H., 1996. The Determinants of Foreign Direct Investment in Developing Countries, *Transnational Corporations*, vol 5(2), 67-105.
Keynes, J. M., 1930. A Treatise on Money, 2 vols. London: Macmillan 1971.
Kim, H., 2010. Political stability and foreign direct investment. International Journal of Economics and Finance, vol 2(3), 59-71.
Kindleberger,C., 1969. The Theory of Direct Investment and The International Corporation, American Business Abroad, MA: MIT Press.
Kobrin, S., 1976. The Environmental Determinants of Foreign Direct Manufacturing Investment: An Ex post Empirical Analysis. Journal of International Business Studies, vol 7(1), 29-42.
Kojima, K.,1973. A Macroeconomic Approach to Foreign Direct Investment. Hitotsubashi Journal of Economics 14, 1-20.
Kravis, I. B., 1956. "Availability" and Other Influences on the Commodity Composition of Trade. The Journal of Political Economy, 64(2), 143-155.
Larudee, M., Koechlin, T., 1999. Wages, productivity, and foreign direct investment flows. Journal of Economic Issues, Vol. 33, Issue 2, 419 – 426.
Lee, H-H., Rajan, R.S., 2011. Foreign Direct Investment in the APEC Region: the Role of Country Risks, Source: Journal of Korea Trade, vol. 15(3) 89-123.
Leontief, W., 1953. Domestic production and foreign trade: The American capital position re-examined. Proceedings American Philosofical Society, vol. 97, no. 4, 332-349.
Linder S.B. 1961. An essay on trade and transformation. John Wiley and Sons, New York.
Nigh, D., 1986. Political events and the foreign direct investment decision: An empirical examination. Managerial and Decision Economics, 7(2), 99-106.
Ohlin,B., 1933. Interregional and International Trade, Harvard University Press, Cambridge.
Penrose, E., 1959. The Theory of the Growth of the Firm, New York, John Wiley and Sons.
Porter, M. E., 1992. Capital choices: Changing the way America invests in industry. Journal of Applied Corporate Finance, 5(2), 4-16.
Posner, M. V., 1961. International trade and technical change. Oxford economic papers, 13(3), 323-341.
Ramcharrana, H., 1999. Foreign direct investment and country risk: Further empirical evidence. Global Economic Review: Perspectives on East Asian Economies and Industries, vol. 28(3), 49-59.
Roa, M., García, A. F., Bonilla, L., 2009. Country risk ratings and financial crises 1995 - 2001: A survival analysis. Review of Business, 30(1), 33-45.
Rob, R., and Vettas, N., 2003. Foreign direct investment and exports with growing demand. Review of Economic Studies, 70, 629–648.
Rugman, A. M., 2009. John H. Dunning: Recollections. Journal of International Business Studies, 40(3), 355-356.
Săvoiu, G., Crăciuneanu, V., 2010. The foreign signal of country risk rating, Romanian Statistical Review, Supplement 9,115 – 122.
Săvoiu, G., Crăciuneanu, V., Ţaicu, M., 2010. A New Method of Statistical Analysis of Markets' Concentration or Diversification, Romanian Statistical Review, vol. 58(2), 21-27.
Săvoiu, G., Popa S., 2012a. Foreign Direct Investment (FDI) in Romania, Romanian Statistical Review, vol. 60(1)/ 2012, 42-56.
Săvoiu, G., Popa S., 2012b. Econometric Eclectic Models of Foreign Direct Investments in Romania, after 1990. Economic and Finance Review, vol 1, no 12, 30 –41, http://www.businessjournalz.org/articlepdf/EFR_11202mar2012.pdf, www.efr.businessjournalz.org .
Săvoiu, G., Popa S., 2012c. Statistical Limitations In Timing And Restrictions Of Comparability In Addressing Foreign Direct Investment (FDI), In Romania'S Market Economy, Romanian Statistical Review, vol. 60(2), 61-80.
Săvoiu, G., Popa S., 2012d. An Original Econometric Model of FDI in Romania, Romanian Statistical Review, vol. 60(3)/ 2012, 51-63.
Săvoiu, G., Săvoiu (Matei), S., 2013. Romania's Country Risk and Specific Risk in The National Activities of Tourism - A Comparative Approach, International scientific conference The Romanian rural tourism in the context of durable development, vol (XXXII), Romanian Academy, Gh Zane Institute, Iaşi Tehnopress Publishing House, 65 – 74.
Săvoiu, G., Dinu, V., Ciuca, S.. 2013. Foreign direct investment based on country risk and other macroeconomic factors. Econometric models for Romanian Economy, Romanian Journal of Economic Forecasting, Vol. 16,(1), 39-61.
Solow, R., 1956. A contribution to the theory of economic growth. Quarterly Journal of Economics 70, 65–94
Stopford, J., Strange, S. with Henley, JS., 1991. Rival states, rival firms: Competition for world market shares. Cambridge Studies in International Relations, 18.
Thomas, R., 2006. Foreign direct investment: An activity to assess country risk. Teaching Business & Economics, vol. 10(3), 13-16.
Vernon, R., 1966. International investment and international trade in the product cycle. The quarterly journal of economics, 190-207.
Vijayakumar, J., Rasheed, A.A., Tondkar, R., 2009. Foreign direct investment and evaluation of country risk: An empirical investigation. Multinational Business Review, vol. 17(3), 181-203.
Wang, M., Wong, M. C. S., 2007. Foreign Direct Investment Outflows and Business-cycle, Fluctuations. Review of International Economics, vol. 15, 146–163.

Wells, L., Wint, A., 2000. Marketing a Country: Promotion as a Tool for Attracting Foreign Investment, Occasional Paper no. 13, World Bank. World Development Indicators, Washington, D.C.
Yim, J., Mitchell, H., 2005. Comparison of country risk models: hybrid neural networks, logit models, discriminant analysis and cluster techniques. Expert Systems with Applications, vol. 28 (1), 137–148.

Appendix A. Abbreviations

ECR – Euromoney and its Country Risk
ECR var1 – Euromoney and its Country Risk – beginning of the year rating, usually published in March;
ECR var2 – Euromoney and its Country Risk – end of year rating, usually published in September
ECRCZE – Euromoney Country Risk for the Czech Republic
ECRHUN – Euromoney Country Risk for Hungary
ECRPOL – Euromoney Country Risk for Poland
ECRROM – Euromoney Country Risk for Romania
ECRRUS – Euromoney Country Risk for Russia
ECRSVK – Euromoney Country Risk for Slovakia
FCR – Fitch and its Country Risk
FDI – Foreign Direct Investment
FDICZE – Foreign Direct Investment in Czech Republic
FDIEU – Foreign Direct Investment in the European Union
FDIHUN – Foreign Direct Investment in Hungary
FDIPOL – Foreign Direct Investment in Poland
FDIROM – Foreign Direct Investment in Romania
FDIRUS – Foreign Direct Investment in Russia
FDISVK – Foreign Direct Investment in Slovakia
GDP – Gross Domestic Product
IMF – International Monetary Fund
MCR – Moody's and its Country Risk
P–SCEEC – Post–Socialist Central and Eastern European Countries
S & PCR – Standard & Poor's and its Country Risk
W – worldwide

Appendix B

The detailed competitive single-factorial models of FDI (net inflows as % of GDP) based on ECRvar1 and ECR var2 in Czech Republic and Russia

Dependent Variable: FDI Method: Least Squares Sample: 1993 2012				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	36.09666	8.885592	4.062381	0.0007
ECRCZE VAR2	-0.452175	0.128008	-3.532404	0.0024
R-squared	0.409408	Mean dependent var		4.770000
Adjusted R-squared	0.376597	S.D. dependent var		3.132193
S.E. of regression	2.473050	Akaike info criterion		4.743421
Sum squared resid	110.0876	Schwarz criterion		4.842994
Log likelihood	-45.43421	F-statistic		**12.47788**
Durbin-Watson stat	**1.747998**	Prob(F-statistic)		0.002379

Dependent Variable: FDI RUS Method: Least Squares Sample: 1993 2012				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.552820	0.581809	-2.668952	0.0156
ECRRUSVAR1	0.081321	0.012945	6.282199	0.0000
R-squared	0.686771	Mean dependent var		1.945000
Adjusted R-squared	0.669370	S.D. dependent var		1.312882
S.E. of regression	0.754913	Akaike info criterion		2.370210
Sum squared resid	10.25808	Schwarz criterion		2.469784
Log likelihood	-21.70210	F-statistic		**39.46602**
Durbin-Watson stat	**1.450700**	Prob(F-statistic)		0.000006

Software used: *Eviews*